

This work is licensed under a
Creative Commons Attribution-NonCommercial-
NoDerivs 3.0 Licence.

To view a copy of the licence please see:
<http://creativecommons.Org/licenses/by-nc-nd/3.0/>

URBAN-RURAL INCOME TRANSFERS IN KENYA:
AN ESTIMATED REMITTANCES FUNCTION

By

G.E. Johnson and W.E. Whitelaw*

DISCUSSION PAPER NO. 137

INSTITUTE FOR DEVELOPMENT STUDIES
UNIVERSITY OF NAIROBI.

JUNE, 1972

* The authors, associate professors of economics at the University of Michigan and the University of Oregon, respectively, were visiting research associates at the Institute for Development Studies of the University of Nairobi when the research for this paper was undertaken. They are indebted to C. Kamau, S. Lewis, L. Smith, and J. Stiglitz for pre-draft comments and to the Rockefeller Foundation for financial support.

Any views expressed in this paper are those of the author\$. They should not be interpreted as reflecting the views of the Institute for Development Studies or of the University of Nairobi.

I.D.S. DISCUSSION PAPER NO.137

Urban-Rural Income Transfers in Kenya:
an Estimated Remittances Function.

by

G.E. Johnson and W.E. Whitelaw

ABSTRACT

This paper examines the phenomenon of urban-rural income transfers. The data was collected as part of the Nairobi Urban Study, which included questions on basic socio-economic variables as well as on income remittances. The sample was confined to African low and middle income areas. The data is analysed by regression analysis using variables of income remitted, income earned, wives and children both in and out of Nairobi and indices of the workers attachment to the urban versus his rural area. The results show that the amount that an individual transfers is systematically related to income and other socio-economic variables, and that the total transfer represents about a fifth of the urban wage bill.

The final section discusses some of the implications of the findings, particularly the extent to which the welfare of urban and rural residents is interlinked; the importance of the number and closeness of relatives in the high wage sector, and the implications of the decline of the proportion of income remitted as wages rise.

INTRODUCTION.

In most less developed countries a substantial wage differential exists between urban and rural employment -- even after adjustment has been made for differences in living costs and labor quality. This causes a number of social and economic problems. First, labor market equilibrium can only be established by the existence of a high urban unemployment rate, for many individuals will take their chances with unemployment in the hopes of obtaining the high urban wage.¹ Second, the distribution of income in the society is artificially distorted. Those individuals who are fortunate enough to obtain permanent urban employment enjoy an enormous advantage over those who are forced to remain in rural areas.² This causes dissatisfaction with the existing social system, for there is a high probabilistic element in the determination of individual incomes. Third, job opportunities in the "modern" sector of the economy will be restricted by both large wage changes and a high wage level,³ and this will create downward pressure on wage levels in the rural sector, thus exacerbating the fundamental distortion in the distribution of income.

At the same time, urban wage recipients may remit some of their income back to friends and relatives in rural areas, and this would tend to mitigate the effects of a non-market wage structure on the distribution of income. To the extent that the utility of an individual who is employed in the urban sector depends on the consumption levels of other

-
1. See J.R. Harris and M.P. Todaro, "Migration, Unemployment, and Development: A Two-Sector Analysis," American Economic Review, March 1970, pp. 126-42.
 2. In Kenya the "typical" unskilled or semiskilled worker in the industrial sector earns about 240 shillings per month, whereas an agricultural worker earns about 80 shillings per month. This gross differential must be adjusted for cost-of-living differences between urban and rural employment, which may be as great as two to one for food and shelter. Any income which is transferred to rural areas, however, must be evaluated at the rural price level. There is also the problem of seasonality in agriculture, which blurs comparisons. For a thorough analysis of the determinants of the structure of urban wages in Kenya, see G.E. Johnson, "The Determination of Individual hourly earnings in Urban Kenya," Institute for Development Studies Discussion Paper No. 115, Nairobi, September 1971.
 3. We would like to make it quite clear that we mean that the urban wage level in Kenya is "high" relative to the rural wage and for the country-wide capital-labor ratio; it is not high in any absolute sense or relative to wage levels in developed countries. The official value of the Kenya shilling is one-seventh of the U.S. dollar, so the 240 shillings monthly wage is worth about \$34.

members of the "extended family" who live in rural areas as well as upon his own consumption level, we would expect that urban-rural remittances would indeed occur. The purpose of this paper is to investigate the quantitative magnitude and empirical determinants of these remittances for Kenya. We are able to employ a rather unique data set which provides information on the average amount of money urban workers send to rural areas each month as well as the joint distribution of a number of important socio-economic characteristics. Section II describes this data set and reports the quantitative dimensions of the phenomenon; Section III briefly sets out a theoretical model of income transfers; Section IV provides empirical estimates of a remittances function; and Section V discusses some implications of the findings.

THE DATA.

In the Spring of 1971 the Institute for Development Studies of the University of Nairobi conducted an intensive household survey of Africans in Nairobi under the auspices of the Nairobi City Council. The sample was confined to low and middle income areas of the city, but this does not create much of a problem of bias, for most residents of high income areas are Europeans and Asians.⁴ The survey instrument contained a battery of questions on basic socio-economic variables as well as a series of questions on income remittances. The latter included:

- (1) Do you ever send any money to other areas in Kenya?
- (2) If so, how much money per month do you usually send?
- (3) What is the purpose of sending the money?
 - (a) School fees
 - (b) Paying off debts
 - (c) Maintenance of farm
 - (d) Support of friends and relatives.

Of the 1140 males in the sample who had some income in December 1970, 88.9 per cent responded that they regularly sent some money out of Nairobi. The average amount of this transfer (including the 11.1 per cent who did not remit any income) was 85.7 shillings per month. The average monthly income for the sample was 411.5 shillings per month, so 20.7 per cent of the urban wage bill was remitted. Most of the money was intended for consumption by the extended family, as Table 1, the distribution of responses to Question (3) above, shows rather clearly.

⁴ Details of the Urban Study are found in W.E. Whitelaw, "The Urban Study Survey," I.D.S. Discussion Paper No. 116.

This, of course, presents a rather difficult interpretive problem. Even if the typical urban worker sends money which he intends for consumption purposes, he cannot control how the recipients dispose of their other income. They may increase their expenditures on farm improvements, education, and other nonconsumption items as a result of receiving additional income from the urban member of the family.

Table 1.

Purpose of Sending Money from Nairobi - Percentage of Those Who Remit Money in Each Category.

Purpose	Percentage
(a) School fees	12.1
(b) Paying off debts	1.7
(c) Maintenance of farm	3.6
(d) Support of family and friends	96.2

A THEORETICAL MODEL OF URBAN-RURAL INCOME TRANSFERS.

We next ask what economic theory predicts should be the determinants of the size of the transfer on the part of the typical urban worker. His utility per unit of time can be taken to be a function of his own consumption level (X_u), the consumption of members of his family who live with him in the city (X_c), and the consumption of family members who reside in rural areas (X_r). The shape of this utility function would depend on the number of family members living with him (I) and the number of family members who live away (R) as well as on a set of taste parameters (α) which reflect the relative degree of importance he attaches to his urban and rural attachments. This utility function may be expressed symbolically as

$$(1) \quad U = U(X_u, X_c, X_r; I, R, \alpha).$$

Now the individual's income level per unit of time (Y) is divided between his own consumption, that of the family living with him, and transfers to rural areas (T), that is

$$(2) \quad Y = X_u + X_c + T,$$

and the consumption level of the rural household is its own income (Y_r) plus the transfer, so

$$(3) \quad X_r = Y_r + T.$$

The urban worker maximizes (1) with respect to X_u , X_c , X_r , and T subject to the constraints imposed by (2) and (3). This requires

that the marginal utilities of each of the consumption levels are equated;

$$(4) \quad \partial U / \partial X_h = \partial U / \partial X_i = \partial U / \partial X_r,$$

subject to the satisfaction of the constraints (2) and (3).

In general the consumption levels and T will each depend on the urban worker's income, the income of rural family members, the total size and distribution of the worker's family, and his preferences. For transfers, in particular, we have

$$(5) \quad T = \Psi(Y, Y_r, I, R, u).$$

We would suppose that consumption by rural members of the family is a normal good, which is to say that the marginal propensity to remit, $\partial T / \partial Y_r < 0$. An increase in I , the number of family members living with the urban worker, should raise the marginal utility of X_i relative to the marginal utility of X_r and hence lower T ; an increase in R should have the opposite effect on transfers.

AN ESTIMATED REMITTANCES FUNCTION.

Economic theory suggests that the amount of money the typical worker remits to rural areas will depend on his income, the number of family members living with him, the number of family members living in a rural area, and indices of his general attachment to the urban versus his rural area. We now estimate such a remittances function employing proxy variables available in the Nairobi Urban Study.

The following variables are employed in the regression analysis:

- T : Income (in Kenyan shillings) sent out of Nairobi each month
- Y : Income earned per month
- L : Whether any member of individual's family cultivates land outside of Nairobi (one/zeros variable)
- CI : Number of children living in Nairobi
- CR : Number of children living outside of Nairobi
- WI : Number of wives in Nairobi
- WR : Number of wives outside of Nairobi
- YAN : Year arrived in Nairobi
- ED : Educational attainment (in years)

L , the land cultivation variable, has two potential influences on transfers. First, it is to some extent a proxy for Y_r , the income of the rural

and would have a negative effect on T. Second, cultivation of land by his family may imply present or future ownership of land by the urban worker, and this naturally increases his attachment to the rural area and increases T. The number of family members in and out of Nairobi can be broken down by wives and children, which is desirable, for wives are potential income earners whereas children are dependents in the usual sense. It would have been desirable to have information on the number of dependent parents and siblings, but such information was not available from the Urban Study. YAN, the year the individual arrived in Nairobi, is an index of the degree of rural attachment. The longer the individual has lived in Nairobi the less he feels he is just a temporary resident. Finally, the coefficient on ED, the urban worker's level of educational attainment, should be positive. A high level of educational attainment is often indicative of the fact that a large amount was invested in the individual by a family member or friend, and this would tend to increase the degree to which the worker feels beholden - legally or otherwise - to someone in the rural area.

It is desirable to set up the regression equation with T/Y as the dependent variable rather than T, for we would expect that each of the rural attachment variables would influence the proportion of income remitted rather than simply the absolute amount. If this is so, there would be a problem of heteroskedasticity if T were employed as the dependent variable. The regression results for the sample of 1140 male income recipients are as follows:

$$\begin{aligned}
 (6) \quad T/Y = & - .0501(Y/100) + .00468 (Y/100)^2 - .000139 (Y/100)^3 \\
 & \quad (.0107) \quad (.00135) \quad (.000047) \\
 & + .0391 L - .0208 WI + .0141 WR - .0118 CI + .0164 CR \\
 & \quad (.0111) \quad (.0139) \quad (.0120) \quad (.0036) \quad (.0031) \\
 & + .0035 ED + .00101 YAN + .239 \\
 & \quad (.0017) \quad (.00047) \quad (.038)
 \end{aligned}$$

where $R^2 = .174$ and the standard errors of the estimated coefficients are in parentheses.

The results are generally consistent with our a priori expectations. Each of the coefficients reflecting urban vs. rural attachment has the expected sign, and all but WI and WR are significantly different at conventionally acceptable test levels. Why the number of wives does not have a significant influence on T/Y whereas the number of children residing both in and out of Nairobi does is a matter of speculation. Perhaps the reason is that wives in rural areas are potential income earners, and the implication of the theoretical discussion is that a high rural income will lower urban-rural transfers.

Each child residing in a rural area increases the fraction remitted by .0164; each child in Nairobi reduces the fraction by .0118. These estimated coefficients are not significantly different from each other (the test that the sum of the coefficients differs from zero yielded $t = .92$). CI and CR, as well as WI and WR, were also entered into a regression in quadratic-interactive form to check to see if the relationship is in fact nonlinear, but this modification did not add sufficiently to the explanation to justify itself. At the mean income level, each child living in a rural area receives 6.75 shillings per month from his employed father living in Nairobi.

The coefficients on income suggest that T/Y declines with income up to 881 shillings per month, then increases up to 1363 shillings per month, and declines thereafter. A quartic in income was also tried, but this yielded no additional explanatory power. The elasticity of T with respect to Y is less than unity when T/Y declines with Y ,⁵ so, since over 90 per cent of the sample has incomes of less than 900 shillings, the elasticity is generally less than unity. The bulk of the sample earned between 200 and 600 shillings per month, and, as Table 2 shows, the elasticity in this range is between .5 and .7. Thus, a general increase in the real wage level would tend to lower the fraction of urban income remitted to rural areas.

⁵ Let $T = \left(\frac{T}{Y}\right)Y$. The elasticity of remittances with respect to income $\epsilon = (\partial T / \partial Y) / T/Y = 1 + (Y^2/T) \partial (T/Y) / \partial Y$,

which is $\begin{matrix} > \\ < \end{matrix} 1$ as $\partial (T/Y) / \partial Y \begin{matrix} > \\ < \end{matrix} 0$

It is interesting to note that individuals with very low incomes remit a much higher proportion of their incomes to rural areas than those with moderate or high income. It appears that support of the rural branch of the family is of prime importance to individuals (and is perhaps a major reason for migrating to cities in the first place). Once a minimum level of support is reached, however, the marginal utility of the individual's own consumption becomes higher relative to that of the rural family.

Table 2

Estimated Remittances for Selected
Income Levels Evaluated at the Mean
Values of Rural-Urban Attachment

Variables				
<u>Y</u>	<u>T/Y</u>	<u>T</u>	<u>$\partial T / \partial Y^a$</u>	<u>ϵ^b</u>
50	.280	14.0	.249	.89
100	.259	25.9	.214	.83
150	.240	36.0	.184	.77
200	.222	44.0	.156	.70
300	.192	57.6	.115	.60
500	.153	76.5	.085	.56
750	.132	99.0	.110	.83
1000	.132	132.0	.158	1.20
1250	.138	172.5	.168	1.22
1500	.136	204.0	.097	.71

a - Marginal propensity to remit out of income

b - Elasticity of remittances with respect to income

SOME FURTHER IMPLICATIONS.

Urban-rural income transfers represent about a fifth of the urban wage bill in Kenya, and our analysis shows that the amount which individuals transfer is systematically related to income and other socio-economic variables. In this concluding section we look into a few of the implications of this phenomenon.

First, to the extent that rural and urban residence is a useful distinction in a country like Kenya, the magnitude of urban-rural income transfer implies a very significant increase in rural welfare from what is implied by comparisons of relative incomes alone. If, as is roughly the case for Kenya, the urban and rural wage bills are equal, then aggregate rural income is increased by 20 per cent by the institution of remittances.⁶ This interpretation, however, may be somewhat misleading. Most urban residents still consider their home to be the village in which they grew up; their stay in Nairobi is principally for the purpose of making a good income. The extent to which this is true is indicated by Table 3 which gives the percentage breakdown of location of wife (or wives) for the sample. Given that individual families are spread out in both urban and rural locations, it is not useful to consider the welfare of urban residents and rural residents as independent of each other.

Table 3.
Location of Wives of
Employed Males in Nairobi, 1970

<u>Situation</u>	<u>Per Cent</u>
No Wife	13.2
Wives out of NBI	45.9
Wives in NBI	34.0
Both in and out	6.9

Secondly, the results imply that the welfare of the typical individual in Kenya depends rather significantly on the number and closeness of relatives working in the high wage sector. A crucial question is thus the distribution of modern sector jobs across family units; it is rather similar to and perhaps as important as the question of the distribution of land. Our data on the characteristics of the urban

⁶ This obviously does not make allowance for the size of rural-urban transfers, for which we have no data. Generally, these are the resources raised by rural residents to finance job search in the urban area by a member of the family.

population are obviously of no use in this regard, but future surveys of the rural population would do well to include some questions on the subject.⁷ One would expect that there are important forces which tend to lead to a concentration of urban jobs among families. Families who have a person employed in a regular urban job will have a ready source of information on new job openings and possibly of influence in the employment decision. Further, an employed member of the family can provide funds for the education of his younger brothers and sisters, which in turn gives them a greater chance of obtaining high wage positions.

A final implication follows from the fact that the proportion of income remitted to rural areas declines as income increases. A general increase in the urban wage level has the effects of: (a) lowering the fraction of the wage bill remitted to rural areas and (b) lowering the level of employment. The net effect of an increase in the urban wage on aggregate urban-rural transfers is positive only if the elasticity of transfers with respect to income (ϵ in Table 2) exceeds the absolute wage elasticity of labor demand.⁸ It is unlikely that the long run wage elasticity of labor demand is less than unity, and our estimates of ϵ are between .55 and .7 over the relevant range.

7. For a household survey of rural areas these might include:
How many members of the family (and which ones) have permanent jobs in the urban sector? How much income do they remit each year? What (to the best of the respondent's knowledge) is the age, income, education, and occupation of each of the urban family members?

8. Let Z be aggregate transfers and N total employment in the urban sector. Then $Z = TN$, and

$$\frac{dZ}{dY} = \frac{Z}{Y} (\epsilon - \eta),$$

where $\eta = - \frac{\partial N}{\partial Y} \frac{Y}{N}$. If $\eta = 1$ and we take ϵ to be .65, a ten per cent increase in the urban wage rate would reduce Z by 3.5 per cent.